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(not rare); *Brodiæa capitata*, Benth. (three specimens). *Phacelia Parryi* and *P. grandiflora* are found nearly white occasionally, very rarely pure white.

A bud on a branch of *Mimulus glutinosus*, v. *puniceus*, upon developing in a vase, was identical in color with the typical form of *M. glutinosus*, Wendl.

San Diego, Cal. CHARLES R. ORCUTT.

Absorption in partially severed Branches.—In the recent experiments reported by Francis Darwin (*Nature*, Vol. xxx., p. 9) upon the absorption of water by plants, he alludes with surprise to the fact that "cuts to the depth of half or more than half the diameter of the branch produce practically no diminution in the rate of absorption."

Remarkable instances of a similar, if not identical, phenomenon often come to the notice of the arboriculturist, and the following illustration of the ability of a greatly reduced cellular area to supply moisture, etc., occurred in our garden last year. A large apple-tree, with a spread of branches almost circular, twenty feet in diameter, with four main limbs, twenty-five secondary limbs, and a numerous growth of twigs and final ramifications on the outskirts and summit of the tree, had suffered from being too deeply covered with earth around the trunk, and the epidermal layers sickened and died, contracting the available area by which sap passed to and fro in the general circulation of the tree to a strip of bark less than two inches in width. The trunk at this point was three feet in circumference, and above the zone of dead tissue, which was removed, the bark retained its healthy and normal condition.

The tree put out leaves in great abundance, and blossomed luxuriantly. The disproportion between the area supplied with nutriment from the roots, and the size of the bark connective, seems very remarkable, and may be considered analogous to the conditions in Dr. Darwin's experiment, where the rate of transmission of moisture was unchanged in a half-severed twig. As the season advanced and became drier and hotter, the tree became sickly. It was deprived of the use of a large portion of its roots and could not, with the limited resources furnished it, feed itself with sufficient moisture; but the capacity of a very restricted line of cells to sustain, at least temporarily and under favorable conditions, a perfect union between the body of the tree and its roots was demonstrated.

L. P. GRATACAP.

Botanical Notes.

Palms.—Some interesting details respecting these princes of the vegetable kingdom, as Linnæus called them, are to be found in Sir Joseph Hooker's last report on the progress and condition of the Royal gardens at Kew. The extent to which they have recently been brought into cultivation is noteworthy.

Miller in his Gardener's Dictionary, edition of 1731, knew of seven species; but only two were generally known in conservatories, the dwarf fan-palm of the south of Europe, and the date. Aiton's

Hortus Kewensis, in the second edition (1813), enumerates only 24 species. The Loddiges, great cultivators of palms, who possessed in their day much the largest collection known, enumerate 210 species in their nursery catalogue of the year 1825. In the Herrenhausen conservatories, Hannover, Wendland had assembled 287 species in 1835, and 445 in 1882. This is the largest collection in the world ; but the noblest must be that of the Botanical Gardens of Buitenzorg, Java; which, in 1860, boasted of 273 species, "all standing naked in the open air."

It is only when the literature of the order is brought together systematically, that we appreciate the extent and variety of palms. In the new Genera Plantarum, Sir Joseph Hooker characterizes 132 genera of true palms, and indicates about 1,100 species.

Our readers may like to know what palms are indigeneous to the United States, and what names they now bear. Without counting one or two tropical species which grow in Southern Florida, and which are outlying Cuban and Bahaman species, we have two true palmettos, *Sabal palmetto,* and *S. Adansoni* ; the blue palmetto, *Rhapidophyllum hystrix* of Wendland; the saw palmetto, *Serenoa serrulata* of Hooker. This is the old *Sabal serrulata*, upon which Hooker has recently founded a new genus, dedicating it to our associate, Sereno Watson (*Palmam qui meruit ferat*) there being already a *Watsonia* in honor of an earlier botanist of this name. Finally we have, just beyond our national borders, namely on the Islands of Lower California, a palm of a peculiar genus, instituted by Mr. Sereno Watson, the *Erythea edulis;* and in Southern California the elegant *Washingtonia filifera*, with which Wendland has complimented our country by naming this palm in honor of its first president. The only other president so distinguished is Jefferson. *Jeffersonia diphylla* is one of our choicest spring flowers.—*Science.*

Morphology of the Husk of Carya.—At a recent meeting of the Philadelphia Academy of Natural Sciences Mr. Meehan exibited some nuts of *Carya glabra*, Torr., which had been brought in by one of his seed-collectors from a tree in the woods in the vicinity of Philadelphia. They had two, or sometimes three, nuts in a single exocarp, as in the manner of *Castanea vesca*, the common chestnut. The collector was under the impression that all the nuts borne by the tree were of a similar character.

Dr. Asa Gray, who was present, remarked that this occurrence of two or three nuts of *Carya* within the same husk, either separate or partly coherent, was of much morphological significance. Specimens like these, said to have been collected in Montgomery County, Penn., had been sent to him several years ago, with the remark that the tree bore a good many such abnormal fruits; Dr Gray believed that the conclusion to which they inevitably pointed had not yet been published. It was, however, communicated to Dr. Engelmann, along with a portion of his specimens, at least five years ago. The conclusion drawn was the following: The husk, or so called exocarp, of *Carya*, is an *involucre*, usually containing a single female flower, and connate with its ovary; its true morphology is revealed when, as in this case, it contains two or three flowers. The stone or shell of the nut is the whole pericarp in *Carya* as much as in *Corylus*. In the former genus it becomes free from the four-valved involucre at maturity; in *Juglans* the congenital union is more permanent, forming a drupaceous accessory fruit, of which the fleshy part is involucre, the bony part is pericarp. This view directly homologizes the Juglandaceæ with the Cupuliferæ.

Tamarinds.—There are few people to whom the flavor of preserved tamarinds is not agreeable, but do those who frequently use tamarinds know how they are prepared? They come into commerce both from the East and West Indies; the latter, it would seem, are simply the fruits, or, rather, pods from which the shell or epicarp has been removed, and the pulp together with the strong fibrous framework upon which it is built, and the seeds are placed in alternate layers with powdered sugar in a cask or jar, over which boiling sirup is afterward poured. In the East Indies it seems they are prepared by first removing the epicarp and seeds by hand, after which the pulpy portion is usually mixed with about 10 per cent. of salt, and trodden into a mass with the naked feet. Of these tamarinds several qualities are known in the market, the best being free from fibre and husk, and the worst containing both, together with the hard stone-like seeds, which are commonly eaten in the East Indies after being roasted and soaked to remove the outer skin, and then boiled or fried, when they are said to be tolerably palatable. West Indian tamarinds are alone officinal in the British *Pharmacopœia;* while on the Continent those from the East are alone employed. Besides the tamarinds sent to Europe they are also shipped in large quantities from Bombay to Persia and other northern countries.—*Gardeners' Chronicle.*

Attraction of Insects by Phallus and Coprinus.—E. Ráthay and B. Haas have examined the structure of the fructification of *Phallus impudicus*, with a view to determine the peculiarities in its construction which attracts flies and other insects to it. This is effected partly by the odor and partly by the taste. They find the fluid which results from the deliquescence of the gleba to contain an abundance of sugar; and they observed visiting this as many as fourteen species of insects, most of which also visit the nectar of flowers or feed upon honey-dew. The same phenomenon is exhibited by a number of other species of Phalloideæ; and the explanation suggested is that the insects are useful to the fungi in disseminating the spores which are set free by the deliquescence of the gleba [Cf. BULLETIN, Vol. vii., p. 30, where this same view is put forth by the Editor.]

The pileus of species of *Coprinus* and of some other species of Agaricini also exude sugar.

With regard to the exact chemical nature of the substance formed, the authors state that it consists in all these cases, in addition to dextrose, of another sugar which belongs to the same class and is probably trehalose. In *Phallus impudicus* there are no less than three substances which reduce alkaline solution of copper, viz., dextrose, torulose, and a substance intermediate between dextrose and gum. In *Coprinus deliquescens* the only one of these substances present is dextrose.

The Parasites of Money.—The *Frankfurter Zeitung* states that Dr. Reinsch has found, as the result of a long series of minute investigations, that the surfaces of 50-pfennig pieces which have been long in circulation are the home and feeding-ground of a minute kind of bacteria and vegetable fungus. An extended series of observations showed that this is the case with the small coins of all nations, the thin incrustation of organic matter deposited upon their surfaces in the course of long circulation rendering them very suitable for this parasitical settlement. Dr. Reinsch scraped off some of these incrustations, and with a small scapel divided them into fragments, which were subsequently dissolved in distilled water. The employment of lenses of very high power showed the bacteria and fungi distinctly.

The Banyan tree.—Respecting this tree, Forbes, in his "Oriental Memoirs," says that a Banyan tree, named Cubbeer Burr, was nearly 2,000 feet in circumference, measured round its principal stems, but that the ground covered by its overhanging branches was considerably more extensive. The large trunks numbered 350, and the smaller ones exceeded 3,000. This tree at one time was considerably larger, a fearful storm, accompanied by a flood on the Nerbudda, having carried away a greater part of it, reducing the number of the larger trunks from 1,350 to the 350 now remaining. The original size of this colossal tree may be better conceived by remembering that 2,000 feet, its circumference when Forbes saw it, is more than one-third of a mile. It is truly one of the wonders of Nature. The careful provision by which everything is made to adapt itself to the circumstances in which it is placed is strongly exemplified in the growth of this tree; for if these branches did not throw out roots, and so form a trunk with which to support their own weight, they would tear themselves off from the parent stem.—*The Garden.*

Absorption of water by plants.—Mr. F. Darwin, in an article on this subject recently published in *Nature*, shows that the rate of absorption is influenced by the dampness or dryness of the air, being more rapid in dry air, owing to the more rapid evaporation from the leaves, and more rapid in sunlight than in shade. He also confirms Baranetzky's statement that a small disturbance, such as a slight shake, by increasing the transpiration from the leaves, increases the rate of absorption, while cutting off a twig rapidly diminishes it. A. Sorauer, however, found in some experiments on gourds that the removal of leaves from plants on two occasions did not alter the amount of evaporation in the least; and even when half the leaves were removed from another plant, although a reduction in the amount of evaporation ensued at first, after eleven days the evaporation was equal to that of an untouched plant.

The American Association for the Advancement of Science.—The committee of the American Botanical Club of the A. A. A. S. has so far arranged the programme for the next meeting in Philadelphia, opening September 4th, that they are enabled to assure the botanists of the country a most enjoyable and profitable time. All botanical members of the Association should call at the Academy of Natural Sciences as early as possible after arrival and register. They will find a committee in charge to welcome them to the privileges of the

Club and of the Academy, and to assist them in becoming acquainted with other botanists.

Excursions in addition to those of the general Association have been arranged to the pine barrens and to the Bartram gardens, and others will be added. Upon Monday evening, September 8th, the Botanical Section of the Academy of Natural Sciences will give a reception to the Club at the rooms of the Academy. The hours for meeting of the Club will be annouced daily during the session.—J. C. ARTHUR, Chairman of Committee.

Botanical Literature.

A Manual of the Mosses of North America. By Leo Lesquereux and Thomas P. James. With Six Plates illustrating the Genera. 8vo, pp. 447. Boston: S. E. Cassino & Co. 1884.

In this volume we have a manual which will be greeted by all botanists as a valuable addition to the literature of the subject, supplying a need that has long been felt. To the arduous and protracted labors of the authors, with the assistance of other eminent bryologists, both in this country and abroad, the students of this delightful branch are indebted for a most satisfactory guide. It contains 447 pages, with descriptions of nearly 900 species, includes a good glossary and is illustrated with six plates. The type is clear, and the descriptions are full and amended from the most recent investigations—corrections and additions having been made just before going to press. We notice with pleasure copious descriptions of the orders and tribes, with bibliographical references and systematic tables. The classification is that used in "Sullivant's Mosses" (Gray's Manual, 1863), with additions; the class being sub-divided into three orders, Sphagnaceæ, Andreæaceæ and Bryaceæ; the first two including one genus each, the last, 23 tribes and 126 genera. One oversight has been noticed on page 5 which contradicts the text on page 95. *Eustichia* is given under the sub-division of "Teeth of the peristome 16," and, below, "fruit unknown."

The Sphagnaceæ are briefly described, and references are made to monographs for details. It is to be regretted that a whole plate was not devoted to them, and some of Braithwaite's excellent illustrations of the leaf- and stem-structure given, especially as the other plates, with one exception, are those used by Sullivant.

The Hypneæ are given in one genus with 28 sub-genera and 195 species.

As the name implies, Alaska, British America, Greenland and the United States are included in the range of the mosses, but Mexican species are omitted, which is a disappointment, as they are to be found in Rau and Hervey's Catalogue of N. A. Mosses. However, as a description of them would have entailed a further delay, since the Mexican collections are chiefly to be found in German Herbaria, we can excuse this omission and hope to see a demand for a Bryologia Americana on the scale of the Bryologia Europæa at no distant day.—ELIZABETH G. KNIGHT.